



**AN ANALYSIS OF ENGAGEMENT OF THOSE WHO
TELECOMMUTE
VS.
THOSE WHO DO NOT
THESIS**

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THESIS

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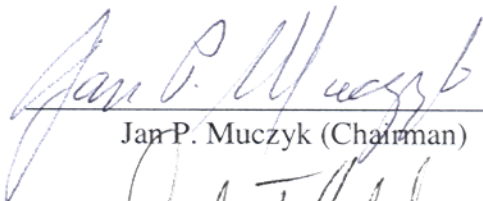
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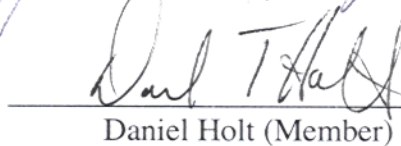
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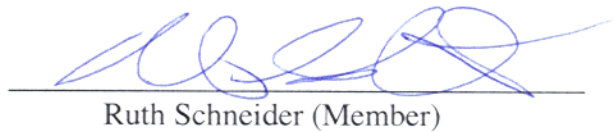
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Abstract

Telecommuting is a program used by many of the successful companies in the private sector, both as a cost savings measure and as a way to recruit and retain quality personnel. Telecommuting has also been used by many companies to adhere to stricter environmental mandates. The public sector, however, has been slow to implement telecommuting programs. Buckingham and Coffman of the Gallup Organization have done extensive research into what they call “engagement,” and as to what comprises an engaged employee. They also developed a twelve question survey (referred to as the Q12) to determine if an employee is engaged or not engaged. Documented literature points to telecommuting as a possible way to increase an employee’s engagement. This study attempted to ascertain whether telecommuting programs that have been implemented at Wright Patterson Air Force base have increased engagement levels among those who telecommute. The Q12 was administered to both telecommuters and non-telecommuters at Wright Patterson Air Force Base, and then a statistical analysis was performed on the mean score of each question and on the overall mean score for each group to determine if there was a statistically significant difference between the two groups. No differences were found on eleven of the twelve questions of the Q12.

An Analysis of Engagement of Those Who Telecommute vs. Those Who Do Not

I. Introduction

General Issue

Telecommuting is an important element in the job search process in the civilian sector. It is also a key element in the decision process of many employees when it comes to remaining in their current job, with their current company, or whether to search for a better opportunity (Chadderdon, 1999; Strum, 2002). The current competitiveness in the job market between the civilian sector and the government is making it imperative for government agencies to explore new options to help increase recruiting and retention. This is exacerbated by the fact that the DoD is in the midst of a personnel crisis, and is facing the prospects of losing years of experience because of the aging workforce. The DoD must find new ways and implement new programs to attract and retain high caliber employees if we are to remain the premier fighting force in the world (Aldridge, 2002).

As quoted from The Acquisition 2005 Task Force Final Report, Shaping The Civilian Acquisition Workforce Of The Future, prepared for The Under Secretary of Defense, Acquisition, Technology and Logistics and The Under Secretary of Defense, Personnel and Readiness, in October 2000, “The Department of Defense (DOD) is facing a crisis that can dramatically affect our Nation's ability to provide war fighters with modern weapon systems needed to defend our national interests. After 11 consecutive years of downsizing, we face serious imbalances in the skills and experience of our highly talented and specialized civilian workforce. Further, 50 percent will be eligible to retire by 2005. In some occupations, half of the current employees will be gone by 2006.

In addition, many are now in their early fifties and occupy positions of great responsibility or have extensive experience and unique skills within their organizations.” Restated, not only is the DoD perhaps going to lose many of its acquisition professionals, but many of them are in positions of authority, and there is a minimal availability of similarly experienced replacements.

This is a vital resource to lose, especially at a time when our nation is battling terrorism and other external and internal threats. Another issue is the DoD’s competition with the civilian sector for talented and competent personnel with the technical skills needed by the DoD. “For the past decade, it has been increasingly difficult to attract ‘the best and brightest’ to national security service given competitive alternatives in the private sector and ten years of downsizing. As more and more civilian positions become high technology jobs, DoD is increasingly drawing on the same pool of talent and skills as the private sector that can offer greater economic rewards as well as the chance to work with advanced technology. At the same time, the current body of legislation and regulation is an increasing disincentive for government service.” (Your Acquisition Future, <http://www.acq.osd.mil/dodat/workforce/story.htm>). However, there is a possibility that because of the events of 9/11, patriotism could help to overshadow the pay gaps, if only for a while. Therefore, addressing issues of technology appears to be of benefit.

Background

Darlene Druyun, Former Assistant Secretary of the Air Force for Acquisition, in her CORONA briefing on 2 November 2001, made several important points about the

future direction of the acquisition community, and how it should address change and innovation. She cited such current challenges as keeping pace with current technology, embracing innovation, and adapting to a changing doctrine. Her solutions are that people should be encouraged to take risks, and people should be freed to execute their decisions. She reinforced this initiative in her Lightning Bolts, which are a series of reform initiatives to push needed changes in the way the acquisition community does business. The first set of Lightning Bolts launched in 1995 was followed by a second group in 1999. Ms. Druyun stated, while speaking to a group at Los Angeles Air Force Base in May 2002, “It is estimated that these Lightning Bolt initiatives have resulted in some \$30 billion in cost savings or avoidance.” With the release of Lightning Bolts 2002, the Air Force embarked upon the path to accomplish its most ambitious set of initiatives to date. Together the six new Lightning Bolts represent the push for "Agile Acquisition," the ability to deliver new capability to the war fighter as quickly as possible and at the promised cost, especially #3, Roadblock Busters. Ms. Druyun states that we should create Innovation “Wildcatters,” who are not risk averse, and not punish them if a project fails. By not punishing them, this creates an atmosphere of innovation, without fear of retribution, which would stymie risk taking. This is a powerful attempt to overcome the perception of a “One Mistake Air Force”, where careers are destroyed by one mistake or risk taken that didn’t go as planned. While this is going to be a tough change to implement, given the strong culture of the military, this change has to start somewhere, and Ms. Druyun has stated it is going to start with her.

Telecommuting may be one way to help address these issues. Telecommuting is a concept that has been around for many years in the private sector, but is just coming into

its own in the DoD. It has been shown that civilian organizations that implement telecommuting programs have more employees who display many of the same traits as an “engaged employee”, -- someone who is happy with their job, enjoys coming to work, is more productive, takes fewer sick days, and is significantly less likely to quit the organization to take a job elsewhere (Chadderdon, 1999; The Kensington Report, 1998; The Wirthlin Report, 1999). All of this leads to greater productivity, and ultimately lowers costs and can help to increase profitability and competitiveness of a firm.

Engaged employees, as defined by Buckingham & Coffman (2000) are “...loyal and productive – they are more likely to stay with their company for at least a year, less likely to have accidents on the job, and less likely to steal.” It is further defined by Harter, Schmidt, and Hayes (2002) as “...an individual’s involvement and satisfaction with, as well as enthusiasm for, work.” (p. #269) With the current manning problems that the Air Force is facing, and the problems that the Air Force is having attracting new applicants with the required skill sets, it is important not only to recruit new talent, but also to ensure that the current talent does not leave the organization, or become a negative factor within the organization. Therefore, trying to create the “engaged” employee, as opposed to the “disengaged” employee is essential. The key, then, is to measure the “engagement” of those employees who are telecommuters, and compare their level to the engagement level of employees who do not telecommute. The focus of this research effort, then, is to examine the extent that telecommuting leads to engagement among employees.

Specifically, this effort will compare two groups on the engagement scale:

1. Those who do telecommute (experimental group)
2. Those who do not telecommute (control group)

Problem Statement

As has been noted earlier, Wright Patterson Air Force Base, as well as the rest of the DoD, is facing a personnel crisis. Given this fact, senior leadership needs to implement new programs to help recruit and retain its most valuable asset, its people. These new programs need to foster innovation since the research has shown that today's employees look for organizations that desire innovation. (Your Acquisition Future, <http://www.acq.osd.mil/dodatlworkforce/story.htm>), and help to create "engaged" employees. While much of the civilian sector is quick to change and implement new ideas out of necessity, federal agencies many times are not. This is because federal agencies are typically bureaucratic, and bureaucracies are typically risk averse (for reasons described earlier). Telecommuting, however, may be a partial answer to this problem. Toward this end, the Aeronautical Systems Center, Strategic Human Resources Office (ASC/HRV), has implemented a telecommuting program throughout ASC, but few individuals have taken part in it. While many employees are eligible to telecommute, only about 10% are actively telecommuting because many supervisors are not implementing the program, or won't allow their subordinates to telecommute. Ruth Schneider, head of ASC/HRV, states: "Many supervisors cite factors such as 'It is too difficult to redesign the jobs to allow it' or 'there just won't be enough of a cost savings to make it worthwhile'. Supervisors also do not believe that it will make their employees

more productive, and many believe that if you can't see them, they won't work". As detailed in Chapter II, telecommuting offers many benefits for cost savings in facilities maintenance and addresses many federally mandated environmental issues. However, if telecommuting is shown to be a program that can help to create an "engaged" employee, which hopefully will lead to an increase in recruiting and retention of quality personnel (findings based upon prior research done by Buckingham and Coffman, 2000), it further lends itself as an option that should be implemented on a broader scale.

Research Objective

The intent of this research effort is to test whether those employees who are telecommuting are any more (or less) engaged than those employees who are not. Existing data indicate that the organization is better off with engaged employees (Buckingham & Coffman, 2000; Harter, Schmidt and Hayes, 2002). If the data demonstrate that the telecommuting group is more engaged, then this would suggest that the supervisors should be even more open to implementing the telecommuting program on a wider scale (if it can also be shown to be cost effective, and that the jobs lend themselves to being able to be accomplished via a telecommuting arrangement). Based upon the merits of creating engaged employees, and with the encouragement of their superiors, many skeptical supervisors probably can get past their reluctance to accept and implement telecommuting as a viable option.

Approach

The Gallup Organization has been studying engagement for about 25 years, and has asked well over 10,000 questions to over 1 million employees and supervisors world-

wide (Buckingham & Coffman, 2000). By using appropriate statistical analysis, they have designed a 12 question survey (the top 12 questions that best measure engagement, cutting across all cultures), appropriately named the Q12. These 12 questions are detailed in Chapter III.

ASC/HRV has randomly identified 36 telecommuters, and then, via matching (explained in more detail in Chapter III), has identified 36 non-telecommuters. These individuals have been contacted about taking part in this research effort, and have agreed to participate. ASC/HRV has been using an on-line tool, Facilitate.com, to administer surveys within its organization. This research effort will utilize this tool for administering the 12 questions, and will also use this tool to compile the data from the results of the survey. The survey is based upon a 5 point Likert scale, from Strongly Disagree (1) to Strongly Agree (5). The data will then be analyzed to determine if there is a higher tendency (higher overall score) for those who telecommute as compared to those who do not.

Summary

Telecommuting has been shown to be a successful tool in the civilian sector for hiring and retaining some of the best talent available, while at the same time driving down costs (Strum, 2002, The Wirthlin Report, 1999, Chadderdon, 1999, Cascio, 2000). The DoD has been slow to adopt and implement telecommuting, (even though directed by Section 359 of Public Law 106-346), but this is a position that may need to change if it can be shown that telecommuting produces more engaged employees. This research, while limited in scope to telecommuters compared to those who do not telecommute, is

investigating the question: Is there an increase in engagement among those who do telecommute? If so, leadership should send a strong signal to those supervisors who will not allow telecommuting within their organization, so that they may rethink their position.

II. Literature Review

The job market today is vastly different from the market of the past. Many employees today are “computer literate,” having grown up with computers in their household, and, typically, are comfortable with (and have used) pagers, cell phones, PDA’s, and other new technology (Strum, 2002). Appealing to this type of employee is a key factor in recruiting, and is an issue that civilian institutions as well as the Department of Defense must find ways to address. Many business leaders have stated that a business’ biggest asset is its people (Chadderdon, 1999; Posnock, 2000). It makes sense, then, to try and do whatever possible to hire and retain the best people. Since 9/11, many companies also have to address issues of safety and security for their employees, while at the same time looking for ways to reduce costs. Many employees are also looking for ways to reduce their expenses. Telecommuting is one option that offers a potential solution for both parties. This research effort will seek to determine whether or not a telecommuting program implemented by the DoD will lead to more engaged employees.

Engagement

Marcus Buckingham and Curt Coffman, in their book First, Break All The Rules, set out to determine what makes great managers and great employees. After an exhaustive 25 year study, and a rigorous statistical analysis (to be covered in detail in Chapter III), they determined that there are 12 questions that can be answered by any employee, which will determine whether the employee is engaged, not engaged, or disengaged. Engaged employees are defined as “loyal and productive – they are more likely to stay with their company for at least a year, less likely to have accidents on the

job, and less likely to steal.” Non-engaged employees are defined as “productive but not psychologically connected to their company – they are more likely to miss work days and more likely to leave to find another employer.” Disengaged employees are defined as “physically present but psychologically absent – they are unhappy with their work situation and insist upon sharing this unhappiness with their colleagues” (Buckingham & Coffman, 2000).

Telecommuting

Telecommuting (also known as “telework,” “virtual officing,” “hotelling,” and “satellite officing” (Strum, 2002)) is a concept whereby the employee works from a home office or some other location for either a portion of or all of the work week. He or she maintains a presence in the office electronically via phone, fax, pager, and e-mail and is usually, at a minimum, required to participate in some quarterly, monthly or weekly meetings at the work location. This concept was pioneered by Jay Chiat, chairman and CEO of Omnicom Group’s DDB Worldwide, New York (the firm that popularized the Energizer Bunny). His idea was to give employees cell phones, but no permanent desks from which to conduct business. This change in thinking and radical redesign of the work arrangement truly broke the paradigm of the time (Cuneo, 2002).

Telecommuting Advantages

In today’s competitive, global environment, the pressure is on for companies and the government to cut costs, boost profits (civilian sector only), increase productivity, meet employee expectations of job satisfaction and independence, while also meeting

government mandates to become more “environmentally friendly.” Allowing employees to telecommute can greatly decrease the capital spending needed to sustain a business and the offices where the employees work. For example, telecommuting allows a firm to reduce the amount of office space that has to be rented, which leads to lower rent and utility bills. Telecommuting can be a great way to reduce expenses without resorting to layoffs. More employees working from alternate locations allows an organization to invest valuable resources in other aspects of the company, such as purchasing more efficient equipment, building “slack” into the work schedule, and research and development efforts, instead of improving office conditions, or spending money on utilities. (Cascio, 2000; Kurland & Bailey, 1999; Strum, 2002).

Avoiding layoffs by implementing telecommuting can actually lead to improved productivity from employees (The Wirthlin Report, 1999). Seven in ten employees of downsized companies say that instead of a more efficient organization after the layoff, the remaining employees just had to work harder to make up for those who were fired. This number is up from five in ten reported in 1996 (The Wirthlin Report, 1999).

Many managers and CEOs of Fortune 500 companies confirm that employees are the driving force behind a successful organization. Employers who are willing to evaluate alternatives to downsizing are more apt to create “committed” or “engaged” employees. Teleworking has been shown to create more positive attitudes in employees. Telecommuters rate their company more favorably, believing that their company listens to them, cares about them, and rewards them more than traditional companies. These employees also tend to recommend their company to others and express job satisfaction more often (The Wirthlin Report, 1999). Employees who telecommute also produce 30%

more work in the same amount of time as their traditional go-to-the-office peers (The Kensington Report, 1998).

Marcus Buckingham and Curt Coffman, from the Gallup Organization, did an in-depth, 25 year study of great managers across a wide variety of situations and in different industries, markets, and of organizations of all different sizes. Their findings demonstrate that it is important to build “engaged” employees. While not specifically stated by Buckingham and Coffman, one way to help build “engaged” employees is by providing the flexibility of a virtual office environment. This can facilitate recruiting of new high caliber employees who have grown up in the computer age.

These new employees have never been without a computer and are comfortable communicating via electronic media vs. face-to-face. These employees have little employer loyalty, and they want to balance their work schedule with their personal lives. They will, at a moment’s notice, move to another employer who is better at meeting these needs. Until now, the work environment wasn’t viewed as a strategic asset, but this item is now becoming a priority for new employees. Technology is one key to being fast, nimble, and adaptable, and telework is a natural offshoot of this technology boom. If the DoD is to successfully recruit and retain high caliber personnel in the future, it must recognize what is happening in the civilian sector and implement a plan of action. If leadership in the DoD can properly employ this strategy of focusing upon the work environment as a competitive advantage, competing with the civilian sector for qualified personnel becomes that much easier (Chadderdon, 1999).

Finally, supporting a virtual office concept helps to meet tougher and tougher environmental standards, and can help to create good will towards the organization.

According to a US Government study, if only 20,000 federal workers were to telecommute just one day a week, they could save more than two million commuting miles, 102,000 gallons of gasoline, and 81,600 pounds of carbon dioxide emissions each week (Cascio, 2000). An organization that implements a telecommuting program could help the environment by having to consume less energy (less office space would require lower utility use), it could reduce the need for employees to commute to work, which, as demonstrated above, would reduce carbon-dioxide emissions, increase the life expectancy of the infrastructure of the United States (less use of highways), and reduce our dependence on imported crude oil (which could lead to a positive impact on our economy). On military bases, a telecommuting program could provide greater security for employees by varying their driving patterns and dispersing them on a daily basis, reduce backlogs at security check points, and reduce the amount of work space required (Currently, the DoD has many buildings in need of repair or restoration – telecommuting could reduce the amount of money that needs to be spent in these areas), resulting in lower utility costs.

While the concept of teleworking is appealing to some organizations, it is equally as appealing to some employees. Employees who telecommute immediately gain flexibility in their work schedules, who they are employed by, and where they live. Such employees need not “arrive” at their designated work space; they can adjust their schedule accordingly (if feasible given the constraints of the organization and the position), and work when they are most productive, whether that is in the early morning, or late at night (Kepczyk, 1999; Kurland, 1999). This, in-turn, can make them more productive, and reduce the amount of time that they actually have to be absent from

work. An International Telework and Association Council (ITAC) study reports that “teleworkers reported, on average, working one-half a day after completing their personal, child-related and adult-related tasks – compared with the alternative of taking a full day off to take care of these necessary items” (Strum, 2002). If an employee is a telecommuter 100% of the time, and he or she doesn’t have to go to an office at all, the employee can have the freedom to live wherever he or she wants, and could allow the employee to work for more than one employer (Cascio, 2000; Posnock, 2000; Demarie & Hitt, 2000).

Another benefit to the employee is the reduced or eliminated commute time (Kepczyk, 1999). This is especially important in highly congested areas where commute times can skyrocket. Research shows that the average American spends about 1.5 hours daily commuting to and from work (Strum, 2002; The Kensington Report, 1998; Workthing.com). Reduction in telecommuting time, and less money spent on child care, lunches, and fuel, plus the reduction of wear and tear put on an individual’s car, all point to great cost savings for those who telecommute. Also, since telecommuters don’t typically have to go to an office environment, they can save money on wardrobes and dry cleaning as well (Kepczyk, 1999; Kurland & Bailey, 1999; Zeleny, 1998).

Telecommuting is also a benefit for the employee as it relates to family life. Given the freedom of flexible work hours, it makes it possible for the employee to spend more time (or perhaps be there at the right times) with his or her family. An example is: If a child is playing in a sporting event at 4 p.m., a traditional 9-5 job would not allow for the parent to attend. Telecommuting can free up this time to make the all important family time a reality. In a study done by ITAC at AT&T, 77 percent of employees participating in off-

site work programs reported more satisfaction in their personal and family lives since they had began the telework arrangement (Strum, 2002). This would help to reduce turnover and absenteeism.

What Are the Pitfalls of Telecommuting

While many companies acknowledge the possible benefits of offering telework as an option, many still shy away from implementation. There are many reasons for this. Implementation would require a whole new skill set when it comes to managing telecommuting employees (Strum, 2002). Managers have to adapt to managing someone whom they might never see, and have to change their philosophy of “management by sight” to “management by what is delivered” (Pearlson & Saunders, 2001), and in many cases managers have to change the job design (Demarie & Hitt, 2000; Shin, Liu, Olivia, & Higa, 2000). These items translate into requiring that a manager trust the employee more (Chadderdon, 1999; Hawkins, 1999; Strum, 2002; Workthing.com). There are also significant up-front cost issues. An employee who works from home needs the proper equipment to do the job. These costs can skyrocket early on (from \$3,000 - \$5,000, plus about \$1,000 in upgrades every year thereafter) (Cascio, 2000). Along with the costs of the equipment, security becomes an issue.

With many employees working outside of the office, trying to secure the computer networks is similar to trying to secure a house with the doors and windows left permanently open (Hulme, 2001). New technologies, such as Virtual Private Networks (VPN), are helping to change this, but they are costly in the near term (Moore, 2000). Teleworking also causes some problems with workplace synergy (Kurland & Bailey,

1999). Many casual conversations that result in good ideas or new ways of doing things can never take place; interpersonal skills can not be developed among employees; managers can't have spontaneous meetings; and there is a general decline in camaraderie (Posnock, 2000). There may also be resentment from those employees not chosen to telecommute (Kurland & Bailey, 1999). Teleworking may also cause issues with insurance and zoning laws (there may be laws that prevent an employee from working out of his or her home). But, telecommuting is a new concept, and there aren't many precedents set for employers and lawyers to draw upon (Kepczyk, 1999; McCune, 1998).

From the employees' perspective, there are challenges associated with telecommuting as well. Feelings of isolation (Cascio, 2000; Kurland & Bailey, 1999) can be common, as the full-time telecommuter has little interaction with co-workers and supervisors. Spontaneous learning, which happens regularly during the course of a day in the office, is hard to achieve if one never goes to the office. Many telecommuters cite this as a hindrance when it comes to career progression. They feel that if they are out of sight, they are out of mind, and that they are not privy to all of the "insider" information that helps one get promoted. Teleworkers are often plagued by not knowing what is specifically expected of them. This can lead to stress, and even more uncertainty about career progression (Gainey & Kelley, 1999). Employees who work at home sometimes have a hard time "going home for the day." Telecommuting may make a work-a-holic work even more, because it is harder to distinguish between office time and home time (Rau & Hyland, 2002). Telecommuters may also have less "personal" time, since work is being done at home. It has been suggested that many people actually need the commute from work to home in order to "decompress", or refocus themselves from the

work challenges to the home challenges that lay ahead (Kurland & Bailey, 1999). Not getting this time may put a strain on the family life. There is also a certain “motivation” that comes from working in an office environment, and those who work at home need to be self motivated in order to be productive. Teleworkers need to be able to set boundaries, and ensure that work time is work time, and not everyone can do this (Rau & Hyland, 2002).

Is Telecommuting a Feasible Solution

Many successful companies currently offer telecommuting options, among them, Aetna, Ameritech, AT&T, Citibank, Eastman Kodak, MCIWorldcom, Sears, 3Com, United Airlines, and Xerox (Hamilton College Career Center). Two out of every three Fortune 500 companies employ teleworkers, and over 40 million employees telework on a global basis. The DoD works hand-in-hand with many of these companies, and could utilize their experience to create a successful program. It is estimated that by 2003, more than 137 million workers worldwide will telecommute at least on a part time basis (Cascio, 2000). The federal government currently has 25,000 workers who regularly telecommute (about 1.5 percent of the workforce), and hopes to have 15 percent of the workforce working at home or in satellite offices by the end of 2002. At Wright Patterson Air Force Base, organizations can rely on the experiences of these other federal organizations as well (McCune, 1998). The GAO reported in July of 2000 that the number of teleworkers has increased 20 percent per year during the last decade, and today, some 16.5 million people work from home at least once a month, and 9.3 million do so at least once a week (Radigan, 2001).

These statistics are compelling evidence that telecommuting is not a fad, but a management tool that is coming into its own. Hiring and retaining the most skilled employees is increasingly important. Many organizations have discovered that offering telecommuting programs helps them to attract and retain employees in a tight labor market (McCune, 1998).

Another factor to be considered is the attack of September 11th. This attack has raised employees' concerns about safety and security to new levels. Telework arrangements can help to address these issues. Current employees also want more opportunities for telework, and their top priorities are flexibility and control of their own time (Cascio, 2000). Continuity of operations is becoming a bigger player in the DoD and in the dynamically changing marketplace and business arena; people are the foundation of this continuity. Given this information, it would seem that implementing a telecommuting program would be a good way to increase an organization's chances of retaining the best and brightest employees, while at the same time wooing new members to join the organization (The Wirthlin Report, 1999). Taking this into consideration, there are some items to be evaluated before implementation of a telecommuting program. Organizations that have successfully implemented telecommuting programs have a common step by step process: (McCune, 1998)

1. Departmentalized decision making
2. Good guidelines
3. Well thought out contracts
4. Training for managers and employees
5. Evaluation measures
6. The right equipment
7. Union collaboration
8. Supervisors who believe in telecommuting
9. Commitment of resources, people, and time

First, telecommuting must be implemented in a strategic fashion. It must be driven from the top down, not from the employees upward. Leaders must make the determination of whether the organizational culture is conducive to a telecommuting arrangement. If the culture of the corporation is heavily dependent upon social interaction, then telework might not be a good solution (Gainey & Kelley, 1999).

To help ensure a successful implementation, the right types of managers must be identified. The skills required of managers who are going to supervise telecommuters are as follows: they must have an open, positive attitude that focuses on solutions; effective communications skills, both formal and informal; a results-oriented management style; and an ability to delegate effectively (Cascio, 2000). Managers must understand that not all jobs are good candidates for telecommuting. After identifying good candidates for implementation, managers must then identify employees who have the right skills to take on this new role.

Employees must have very disciplined work habits, and possess knowledge and technical skills to be able to work effectively without supervision. They also need to be motivated to improve their skills on their own, and to know when to ask for outside help (Kepczyk, 1999). The organization then needs to establish good guidelines, and stick to them. The contract entails items such as frequency, duration, performance measures, equipment, and how the arrangement can be terminated. Training for managers should include how the managers should manage remote workers, and ensuring they understand what can go awry with a telecommuter, and how to handle it. For the employee, training should include how to set up a home office, the types of setbacks they might encounter, how to remain productive, how to segment their time, and how to avoid feelings of

isolation. The program must also be evaluated throughout to ensure that everyone understands his or her role, and also so that the manager/employee can voice concerns and give feedback.

Ensuring that the telecommuters have the proper equipment is paramount if they are to be successful. The proper computer equipment, communications equipment, and network connections are key areas. Many employers have unions to deal with; if so, they should make sure that they have worked out the details with the union on what is expected of the employee, and what the union expects from the employee and management. A key element to the success of the program is that the supervisors must be sold on the idea of telecommuting. The last point to be made, which ties back in to support from the top levels, is that there has to be a commitment of time, resources and people. Economies of scale are going to produce the real cost savings...implementing marginally won't give a company the payoff that they were expecting (McCune, 1998).

According to Dr. Muczyk, former professor of Management and Labor Relations in the James J. Nance College of Business Administration at Cleveland State University, and now Chair of Executive Education and Professor of Management, Department of Systems & Engineering Management, at the Air Force Institute of Technology, and Christine Barber, Director of Workplace Research for The Knoll Group (New York, NY), one of the best phase-in options is to run a pilot program.

“Managing the impacts of change demands that you involve your people in a continual planning process. To win their involvement in the process, you have to offer a guarantee that they won't get hurt if they buy into the changes. The biggest source of resistance is the fear of being hurt by changes: losing one's job or one's control over the product. The best way to handle that is to make clear that some changes will be introduced on a tentative basis, and give the people permission to revert to their old ways if the new ones don't work” says Dr. Muczyk.

“Toward that end, pilot programs are useful in helping people to achieve a comfort level, particularly where radical changes are being made to reinforce a new corporate culture or work process, such as teaming or hotelling,” says Christine. “Using a smaller group within the company as a catalyst for change can pave the way for change within the larger organization” (Fernberg, 1995).

This is the stage that ASC is currently in at Wright Patterson Air Force Base, since they have recently setup a pilot program.

How To Test If Telecommuting Is Good

Chapter III describes fully the methodology used to select the control and experimental group for the survey. This section describes the survey, and defends its validity and reliability.

III. Methodology

Sample

The sample was obtained from the Human Resources and Strategic Personnel office at Wright Patterson Air Force Base (WPAFB). This office has data on over 100 personnel who applied and were trained to telecommute as part of a pilot project at Aeronautical Systems Center (ASC) and WPAFB. Working with this office, 36 persons were selected in a stratified random process from among the telecommuters identified (the Experimental group), and then the control group was constituted (from among 100 non-telecommuters) via matching. Matching was used instead of random selection because of the small size of the samples.

The experimental subjects were selected based on their Series, Skill Shreds 1, 2 & 3, Service Computation Date (tenure), Date of Birth, and Education Level. Series and Skill Shreds reflect the primary occupation and the skill level that the individual possesses within that occupation. These are standardized by the Office of Personnel Management (OPM) and these dimensions were considered to ensure that a mix of occupations was represented and that the control group was as similar as possible to the experimental group. The Service Computation Date (SCD) is essentially tenure.

Those with the same Series and Skill Shreds were evaluated first. Then, Service Computation Date and Date of Birth were examined. In short, the effort was designed to create two groups of about the same age and number of years of experience, who were performing similar duties. If these factors correlated, then education level was keyed on as well. The mean Service Compensation Date for telecommuters was 1979 with a standard deviation of 7.37. The mean Service Compensation Date for non-telecommuters

was 1981 with a standard deviation of 9.09. The mean age of the telecommuters was 47 with a standard deviation of 7.67, and the mean age of the non-telecommuters was 46.47 with a standard deviation of 8.84. There were 6 telecommuters with an education level no higher than a high school education, 4 with an Associates Degree, 17 with a Bachelor's Degree, 9 with a Master's Degree, and none with a PhD. There were 11 non-telecommuters with an education level no higher than a high school education, 2 with an Associates Degree, 16 with a Bachelor's Degree, 7 with a Master's Degree, and none with a PhD. Table 1 summarizes this data.

Table 1. Respondent Selection Data

	Telecommuters N=31		Non-Telecommuters N=36	
	Mean	Stand Dev	Mean	Stand Dev
SCD	1979	7.37	1981	9.09
Age	47	7.67	46	8.84
Ed Level	Number		Number	
High School	6		11	
Associates	4		2	
Bachelors	17		16	
Masters	9		7	
PhD	0		0	

Procedures

The survey was web-based. Respondents were initially contacted via email three weeks prior to the survey being posted, notifying them that they had been selected to participate in a research study. Another email was sent the day that the survey was made available, informing the participants how to access the survey, and who to contact if they had problems accessing the survey. Five days after the initial availability, a reminder email was sent, requesting those that had not taken the survey to please do so. It also

included instructions on how to access the survey, as well as a point of contact if the participant had problems accessing the survey. Four days later, another reminder email was sent to all participants, informing them that it was the last day that the survey was going to be posted, and requesting that those who had not taken the survey please do so. Two weeks later, another reminder email was sent, informing participants that the survey was to be kept available for one more week, as well as providing information on how to access the survey, and a point of contact if there were problems accessing the survey. One week after this, a final reminder email was sent detailing that the survey would be available one more week to facilitate obtaining the required amount of responses. This follow-up email also contained information on how to access the survey, as well as contact information in case there were problems accessing the survey. Data was collected for a total of five weeks. After the data were collected, each person's score was then totaled, and an average for each group was calculated. A statistical analysis was performed consisting of a t-test to determine if the difference between the means of the two groups was statistically significant. A t-Test was also calculated for each of the 12 questions of the Q12 instrument.

Engagement

Engagement was measured with 12 items, referred to as the Q12 (see Table 2), using a 5-point Likert scale, where 5 was “strongly agree” and 1 was “strongly disagree”, and was developed by the Gallup Organization (Buckingham and Coffman, 2000). Engagement refers to an individual's involvement and satisfaction with, as well as enthusiasm for, work (Harter, Schmidt, and Hayes, 2002). These 12 questions were

selected from thousands of similar questions asked during many qualitative and quantitative studies conducted over a 25 year period from 1974 – 1999 (36 companies from 21 industries, 7,939 business units, and 198,514 employees). A thorough meta-analysis was then performed, and these questions were shown to be the strongest predictors of employee engagement. Table 2 details the 12 questions that were used in the survey.

Table 2. 12 Question Internet Based Survey

I know what is expected of me at work.
I have the materials and equipment I need to do my work right.
At work, I have the opportunity to do what I do best every day.
In the last seven days, I have received recognition or praise for doing good work.
My supervisor, or someone at work, seems to care about me as a person.
There is someone at work who encourages my development.
At work, my opinions seem to count.
The mission/purpose of my company makes me feel my job is important.
My associates (fellow employees) are committed to doing quality work.
I have a best friend at work.
In the last six months, someone at work has talked to me about my progress.
This last year, I have had opportunities at work to learn and grow.

Harter, Schmidt and Hayes (2002) reported that these 12 items explain a great deal of the variance in what is defined as “overall job satisfaction” in the literature and as a composite measure they have high convergent validities with overall job satisfaction measures. However, the measure of “employee engagement” is used to differentiate these actionable work-group-level facets from the more general theoretical construct of “job satisfaction”, because “employee engagement” measures more than just job satisfaction. It measures an employee’s enthusiasm for work as well as an employee’s job satisfaction. The Q12 items are antecedents of job satisfaction and other measures, such as job involvement, organizational commitment, and intrinsic motivation, all of which lead to a better understanding of how employees perceive their organization, their work, and

themselves. Previous research has demonstrated that the Q12 as a whole has shown a Cronbach's alpha of .91, and the convergent validity of the equally weighted mean of the Q12 to equally weighted means of longer surveys measuring similar facets of job satisfaction and engagement is also .91. The observed correlation of the mean of the Q12 with averages for the overall satisfaction items is .77, with a true score correlation of .91. This lends credence that longer surveys testing overall satisfaction are likely to be statistically redundant to the Q12. The Q12, as a composite measure, demonstrates the same results as longer employee satisfaction surveys (Harter, Schmidt, and Hayes, 2002).

Table 3 gives more insight as to the reliability of the instrument. Table 3 is the result of four studies in which the Q12 was administered three or more times to the same organizations (Harter, Schmidt, and Hayes, 2002).

Table 3. Independent Variable Test-Retest Reliabilities

Employee Engagement (Q12)
Reliability
0.92
0.80
0.79
0.66
(Harter, Schmidt, and Hayes, 2002)

IV. Results

Response Rate

31 of the 36 telecommuters who were asked to participate responded to the survey, and all 36 of the 36 non-telecommuters responded.

Results for Each Question

Table 4 details the mean score, standard deviation, and t-Test (at an alpha of .05) for each group for each question. Question 9, “My associates (fellow employees) are committed to doing quality work,” is the only one that showed a statistically significant difference between the telecommuters and the non-telecommuters. This could be attributable to the fact that many of the employees who do not telecommute believe that their co-workers, whom they see on a daily basis, are committed to their jobs. This would lead to a higher score in this category by the non-telecommuters, as is demonstrated.

Table 4. Results for Each Question

Q12 Questions	Telecommuters		Non-Telecommuters		t-test
	Mean	Std Dev	Mean	Std Dev	
I know what is expected of me at work.	3.94	1.12	4.28	0.74	1.49
I have the materials and equipment I need to do my work right.	4.1	0.87	4.08	0.81	-0.07
At work, I have the opportunity to do what I do best every day.	3.77	1.15	3.89	1.04	0.43
In the last 7 days, I have received recognition or praise for doing good work.	3.29	1.35	3.44	1.38	0.46
My supervisor, or someone at work, cares about me as a person.	4.16	0.64	4	0.93	-0.82
There is someone at work who encourages my development.	3.87	0.76	3.94	0.92	0.35
At work, my opinion seems to count.	3.87	0.67	4.17	0.94	1.46
The mission/purpose of my company makes me feel my job is important.	3.94	1.12	4.31	1.01	1.42
My associates (fellow employees) are committed to doing quality work.	3.94	0.77	4.42	0.6	2.86
I have a best friend at work.	3.1	1.08	3.33	1.37	0.78
In the last 6 months, someone at work has talked to me about my progress.	4.13	0.72	4.17	0.91	0.19
This last year, I have had opportunities to learn and grow.	4.26	0.63	4.36	0.8	0.58

Results for Total Score

Using the statistical package JMP IN 4, a mean of the scores was derived for each group (3.86 for the Telecommuters with a standard deviation of 0.54, and 4.032 for the Non-Telecommuters, with a standard deviation of .62). A t-test was then performed, with the results shown in Table 5. Analyzing the data in Table 5, and assuming equal variances, at an alpha of .05, and the fact that upper and lower bounds do include zero, the difference between the means was not statistically significant. Based upon this statistical analysis, this research can not refute the null hypothesis that telecommuters were no more engaged than those who do not telecommute.

Table 5. t-Test (Assuming Equal Variance)

Mean Score Telecommuters	Mean Score Non- Telecommuters		Difference	t-Test	DF	Prob > t
3.86	4.032	Estimate	0.169504	1.183	65	0.241
		Std Error	0.143258			
		Lower 95%	-0.1166			
		Upper 95%	0.45561			

Analysis

When comparing means across each question, it is interesting to note that the only two items in which the telecommuters scored higher (even though not statistically significant) was: “I have the materials and equipment to do my work right” and “My supervisor, or someone at work, seems to care about me as a person.” It does stand to reason, however, that in order to implement a telecommuting program, supervisor’s would need to ensure that the proper equipment was available to do the job at an alternate

location, and also that increased communication would be required to ensure that proper work was being accomplished in the proper fashion. Although the telecommuters did score lower overall, it was not a statistically significant difference. There seems to be an even spread across education levels in both groups, so that should not have been a factor in the scoring. Also, given that the groups were demographically similar (average age, similar series and skill levels), there should not have been a wide margin of difference in the scores based upon these attributes. Again, this was shown to be true.

V. Discussion and Recommendations

Discussion

Based upon the statistical analysis, for this study at least, it has been demonstrated that telecommuting does not lead to more engaged employees. However, telecommuting was not initially developed to create engaged employees. It was initially developed as a cost savings measure. As stated in Chapter II, there are many benefits to telecommuting. Environmental impacts, such as reduced emissions from automobiles, and reduction in costs associated with facilities management and renovation of aging buildings are but a couple of the benefits of telecommuting. Also, the public sector is seeking to become more like the private sector. As such, the public sector needs to offer similar job benefits to the private sector. Telecommuting, as detailed in Chapter II, is being used more and more in the public sector. It follows that in order to remain competitive in recruiting and retention, the public sector should also offer telecommuting programs, and on a broader scale than what is currently being practiced. While it may not increase the engagement level of current employees, the other factors need to be evaluated. While there are some negatives associated with telecommuting, the private sector seems to be able to address these, and still have successful telecommuting programs. Perhaps the public sector should look more in-depth at how the private sector is working these issues, and follow suit. Another aspect of telecommuting is that it is already being used successfully by many hi-tech companies (as pointed out in Chapter II). Many software companies (such as Microsoft, Intuit, and Eversoft) hire coders who live in India, and those coders write

the code in India, then uplink the code via satellite to the software company. This is one of the best examples of how telecommuting can change the landscape of the business world, and it could work just as well for the public sector as well. Telecommuting is also a good way for businesses to staff positions in remote locations, or in undesirable locales. Cleveland, Ohio provides a great example. Entrepreneurs in greater Cleveland want to increase high-tech jobs there, but potential employees with the proper skills don't want to live there. Telecommuting could be the answer.

Limitations

There were several limitations to this research. I was limited by the research sponsor as to the demographic data we were allowed to request from the participants. We did not have access to their performance reports, and we were not allowed to match each respondent's answers to their age, gender, education level, series or skill level. Because of this, we were limited to as to the internal analysis that could be performed, and the results of this research lead to no real outcomes (such as whether to allow telecommuting or not). Another limitation was the size of our sample. Our sample size was relatively small. If we had a larger sample, the data analysis might have indicated a statistically significant difference between the mean scores of each group. However, with only 31 telecommuters and 36 non-telecommuters, it is hard to determine statistical significance. We were also limited by the lack of other studies utilizing the Q12 (only one could be found in published articles). An in-depth search (Internet based, DTIC, EBSCO, and FirstSearch, and the Social Sciences Citation Index) led to the discovery of no other published studies of the Q12 within other organizations in the public sector. Three attempts were made to contact Buckingham and Coffman to determine if there were other

published studies, with no response. We also contacted the Neilson Group (author of “A Hard Look at Soft Numbers”), but a response from Carl Neilson indicated that they did not have the data that we needed. As such, there is no way to compare results to like-organizations, other than what Buckingham and Coffman state in their book. There were also time and economic limitations (not enough of each). Finally, although we contacted the Gallup Organization and Marcus Buckingham on several occasions, we never received any responses to our requests for statistical foundations of reliability and validity of the Q12.

Recommendations

Future research into this topic should attempt to obtain respondent’s performance reports, especially of those who are telecommuters. This way, a correlation can be made as to if their performance increased, decreased, or stayed the same, after undertaking the telecommuting program. This, of course, assumes that the performance reports are reliable and valid means of determining a subject’s true performance. Future projects should also seek to use additional dependent variable measures, such as job satisfaction, job involvement, organizational commitment, and intrinsic motivation, and not just the Q12. There are many tools available that could facilitate a study of this type, and they should be utilized to get a fully robust group of data. Supervisors should also be evaluated, not just the employees. Past research has shown that engagement levels increase and decrease depending upon the supervisor. Interviews with both the telecommuters’ and the non-telecommuters’ supervisors should be undertaken to determine the personality types of these supervisors (McGregor’s Theory X/Theory Y personality types, as detailed in “Classics of Organizational Theory”, pp. 179 - 184). A

more thorough analysis of age, gender, number of children, and tenure should be evaluated as well. The literature indicates that middle age females with children tend to be the most happy with a telecommuting arrangement. This study was not able to evaluate these criteria, and as such, we do not know how many people in this category were surveyed. The literature also states that only certain types of jobs lend themselves to telecommuting. This project did not specifically look at job functions and job design to determine if there were opportunities to optimize the telecommuting experience through better selection of telecommuters from jobs better suited to this type of arrangement.

In evaluating the Q12, it is not immediately apparent that telecommuting in and of itself would increase these scores. Many of the questions in the Q12 tend to suggest that a person who is at the actual workplace would score higher on these questions, and they did (as demonstrated by our results). Something important to think about, and to take away from this research, is that telecommuting, much like flextime and the 4-day work week, was never intended to increase job satisfaction or employee engagement. Therefore, it would stand to reason that a telecommuting program may not increase these factors. However, as indicated by the report, “Telework Works: A Compendium of Success Stories”, written by the U.S. Office of Personnel Management in May of 2001, there are several examples of telecommuting being utilized as a successful program. The key, however, is that in each instance, the supervisor was willing to try something that was uncomfortable for them, and those who were chosen to telecommute were those that were self-motivators and had already gained the trust of the supervisor and the reputation as diligent workers who needed minimal supervision.

Over the years, it would appear that management may have become disillusioned into believing that telecommuting could be used as a cure-all, when in actuality, it was designed, and should be used for, cost savings in facilities management, federal environmental compliance, and flexibility in recruiting and retention. As detailed in Chapter II, these issues have been researched and proven to be accepted as positive aspects to telecommuting programs.

Bibliography

- Abbott, Charlotte, Gold, Sarah, and Rotella, Mark. . "The Virtual Office," *Publishers Weekly*, 248(22):60 (May 2001)
- Buchingham, Marcus and Curt Coffman. *First, Break All the Rules*. Simon&Schuster, 2000.
- Cascio, Wayne F. "Managing A Virtual Workplace," *The Academy of Management Executive*, 14(3):81-91 (August 2000)
- Chadderdon, Lisa. "Eighty-Sixing the Nine-to-Five," *Architecture*, 88(12):93-94 (December 1999).
- Cuneo, Alice Z. "Jay Chiat Dies," *AdAge.com*. Article. www.adage.com/news.cms?newsID=34540. May 2002.
- Demarie, Samuel M., and Michael A Hitt. "Strategic Implications of the Information Age," *Journal of Labor Research*, 21(3):419-429 (Summer 2000).
- Elkins, Tony. "Virtual Teams," *IIE Solutions*, 32(4):26-31 (April 2000).
- Fernberg, Patricia M. "The Changing Workplace," *Managing Office Technology*, 40(5):14-22 (May 1995).
- Gainey, Thomas W. and Donald E Kelley. "Telecommuting's Impact On Corporate Culture and Individual Workers," *Advanced Management Journal*, 64(4):4-10 (Autumn 1999).
- Gunter, Heather. "Visiting a Virtual Office," *Computer-Aided Engineering*, 20(7):40 (July 2001).
- Hamilton College Career Services. Excerpt from an unpublished article. http://www.hamiltonia.edu/hc_careers/home.htm. February 2002.
- Harter, James K., Schmidt, Frank L., and Hayes, Theodore L. "Business-Unit-Level Relationship Between Employee Satisfaction, Employee Engagement, and Business Outcomes: A Meta-Analysis," *Journal of Applied Psychology*, 87(2): 268-279 (April, 2002)
- Hawkins, Beth Leibson. "Finding the Right Alternative," *Facilities and Design Management*, 18(12):16-17 (December 1999)
- Hill, E. Jeffrey, and Brent C Miller. "Influences of the virtual office on aspects of work and work/life balance," *Personnel Psychology*, 51(3):667-683 (Autumn 1998).

- Hulme, George V. "Going the distance," *Information Week*, 865:64-66 (November 2001).
- Igbaria, Magid, and Tor Guimaraes. "Exploring differences in employee turnover intentions and its determinates among telecommuters and non-telecommuters," *Journal of Management Information Systems*, 16(1):147-164 (Summer 1999).
- Kepczyk, Roman H. "Evaluating the Virtual Office," *Ohio CPA Journal*, 58(2):16-17 (April-June 1999).
- Kleiman, Carol. "Virtual Offices Are A Family Helper For Many Workers," *Las Vegas Business Press*, 17(3):20 (January 2000).
- Kurland, Nancy B., and Diane E Bailey. "Telework: The Advantages and Challenges," *Organizational Dynamics*, 28(2):53-67 (Autumn 1999).
- Lipton, Steven P. "Planning the office of the future—today," *Journal of Accountancy*, 186(6):85-88 (December 1998).
- McCune, Jenny C.. "Telecommuting Revisited," *Management Review*, 87(2):10-17 (February 1998).
- Moore, Cathleen. "VPN cuts CompuCom's home-office telecom costs," *InfoWorld*, 22(14):104-105 (April 2000).
- Moskowitz, Robert. "Let's get it straight about telecommuting! A reply.," *Business Horizons*, 38(4):84-86 (July/August 1995).
- Pearlson, Keri E., and Carol S Saunders. "There's no place like home," *Academy of Management Executive*, 15(2):117-128 (May 2001).
- Pliskin, Nava. "Explaining the paradox of telecommuting," *Business Horizons*, 41(2):73-78 (March/April 1998).
- Posnock, Susan Thea. "The Pros and Cons of a Virtual Office," *Folio: The Magazine for Magazine Management*, 29(13):112 (October 2000).
- Radigan, Joe. "Remote Possibilities," *CFO*, 17(15):5-6 (December 2001).
- Raghuram, Sumita, Batia Wiesenfeld, and Raghu Garud. "Adjustment to telecommuting," *Academy of Mangement Proceedings*, 1-7 (2000).
- Rau, Barbara L., and Maryanne M Hyland. "Role Conflict and Flexible Work Arrangements," *Personnel Psychology*, 55(1):111-136 (Spring 2002).

- Shafritz, Jay M., and Ott, Steven J. *Classics of Organization Theory*
Harcourt Inc., 2001
- Shin, Bongsik, Sheng Liu, R.Olivia, and Kunihiro Higa. 2000. "Telework: Existing Research and future directions," *Journal of Organizational Computing and Electronic Commerce*, 10(2):85-101 (2000)
- Strum, Mary. April 2002. "Telework, Telecommuting, Virtual Officing," *HotJobs.com*. Unpublished article. <http://direct.hotjobs.com/8866727.13770.0.7278>. April 2002
- The Kensington Report. "The Workplace Turns to Telecommuting to Drive Productivity," *Kensington.com*. <http://www.kensington.com>. (April 1998).
- The Wirthlin Report. "Americans On The Job, Part II," *Wirthlin.com*. <http://www.wirthlin.com/extra1/publicns/report/wr9901.htm>. January 1999.
- Troy. "Face Off: Virtual Office Can't Replace personal relationships," *Public Relations Tactics*, 6(11):25-26 (November 1999)
- Workthing.com, No Author. No title. http://workthing-d-aspen.workthing.com/advice/what_is/telecommuting.html
- Zeleny, Milan. "Telework, telecommuting, and telebusiness," *Human Systems Management*, 17(4):223-225 (1998).

Vita

Captain Daniel J. Boeh graduated from New Richmond High School in New Richmond, Ohio. He enlisted in the Air Force after graduating from high school, and served six years as an enlisted member at Mt. Home AFB, Idaho, Kunsan AB, ROK, and Eglin AFB, Florida. He was awarded an Air Force ROTC scholarship in 1995, and attended undergraduate studies at the University of Cincinnati, where he graduated with a Bachelor of Business Administration degree in Marketing and Entrepreneurship in June of 1998. He was commissioned through AFROTC Detachment 665.

His first assignment after being commissioned was at Hill AFB as a Contracting Officer. While there, he deployed overseas in December 2000 to spend three months at Eskan Village, Kingdom of Saudi Arabia, serving as a contracting officer. In August of 2001, he entered the Graduate School of Engineering and Management, Air Force Institute of Technology. Upon graduation, he will be stationed at Wright Patterson AFB.

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14. ABSTRACT Telecommuting is a program used by many of the successful companies in the private sector, both as a cost savings measure and as a way to recruit and retain quality personnel. Telecommuting has also been used by many companies to adhere to stricter environmental mandates. The public sector, however, has been slow to implement telecommuting programs. Buckingham and Coffman of the Gallup Organization have done extensive research into what they call "engagement," and as to what comprises an engaged employee. They also developed a twelve question survey (referred to as the Q12) to determine if an employee is engaged or not engaged. Documented literature points to telecommuting as a possible way to increase an employee's engagement levels. This study attempted to ascertain whether telecommuting programs that have been implemented at Wright Patterson Air Force base have increased engagement levels among those who telecommute. The Q12 was administered to both telecommuters and non-telecommuters at Wright Patterson Air Force Base, and then a statistical analysis was performed on the mean score of each question and on the overall mean score for each group to determine if there was a statistically significant difference between the two groups. No differences were found on eleven of the twelve questions of the Q12.					
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